

# **City of Austin Draft Cemetery Master Plan**

## **Tree Care Work Plan and Gap Analysis**

### **Parks and Recreation Department Urban Forestry**

#### **Definitions**

*Historic Trees:* Individual trees and other plants within the cemeteries are considered historic if they were either growing or planted within the period of significance of a cemetery, or if they are part of a pattern of vegetation from the period of significance.

*Protected Trees:* Any tree 19" in diameter at breast height, ~4.5' from grade (DBH), regardless of species or condition

*Heritage Trees:* as having a diameter of 24 inches or more in DBH, and is one of the following species: Texas ash, bald cypress, American elm, cedar elm, Texas madrone, bigtooth maple, all oaks, pecan, Arizona walnut, and Eastern black walnut.

#### **Summary of Maintenance Tasks and Estimated Costs Analysis**

- Preserve historic trees by developing a tree protection, preservation, planting, and maintenance plan for each cemetery in collaboration with an ISA Certified Arborist and PARD Urban Forestry
  - An MOU between DS & PARD will require a tree mitigation plan to be developed and reported on a semi-annual basis. Estimated 624 hours of labor/year required.
- Perform bulk density testing of CRZs to determine levels of soil compaction, and then aerate using an air-spade as needed.
  - Soil testing was estimated to take 50 hours/year in labor and \$6142/year in testing fees.
- Fertilize trees annually with a slow release organic fertilizer, preferably compost, as determined necessary by soil testing.
  - Compost could be combined with mulch and applied to as much of the CRZ as possible to meet this requirement. Estimated 6867 hours of labor/year required, based on half an hour per tree with a three person crew, average DBH of 17", and 4578 trees. Cost of materials based on \$35/cubic yard of a mulch and compost mix, an estimated 2826 cu yds to cover the ¼ CRZ of 4578 trees with an

average DBH of 17". Soil testing was estimated to take 50 hours/year in labor and \$6142/year in testing fees.

- Mulch all trees, covering as much of the Critical Root Zone (CRZ) as possible, while keeping a mulch free area around trunks
  - Compost could be combined with mulch and applied to as much of the CRZ as possible to meet this requirement. Estimated 6867 hours of labor/year required. Cost of materials based on \$35/cubic yard of a mulch and compost mix, an estimated 2826 cu yds. to cover the ¼ CRZ of 4578 trees with an average DBH of 17". Soil testing was estimated to take 50 hours/year in labor and \$6142/year in testing fees.
- Prune trees to remove dead, broken or diseased wood according to three priority levels:
  - 1<sup>st</sup>: Safety pruning including dead branches ≥4" in diameter, broken branches, etc. Cost estimate based on 225 hours of inspection time, and \$285,763 in contract cost for pruning (estimated from previous years).
  - 2<sup>nd</sup>: Prune for health and structure. Cost based on 2277 hours of labor using in-house crews.
  - 3<sup>rd</sup>: Prune for aesthetics. Cost based on 2277 hours of labor using in-house crews. This work would more than likely be captured by structural pruning, so may not be necessary as a stand-alone service.
- Maintain historic trees, and explore all options for mitigating risk before removal, including cabling, bracing, and propping.
  - If this were included in the inspection process, it would increase the inspection time by an estimated 5 hours per tree. Estimating 3% of cemetery tree considered for removal per year, there would be 137 trees considered for these options, so an additional 685 hours of labor. Installation of these mitigation options would require yearly inspections and maintenance. This is estimated to require ~1 hour per tree per year. If one quarter of all removals were mitigated through cabling, bracing, or propping, this would be an additional 34 hours per year. So an additional 719 hours of inspection time would be required per year. The cost of installation is estimated at \$500 per tree.
- Inspect cemetery trees after large storms to look for tree damage, and prune as necessary.
  - Cost estimate based on performing a level 1 inspection of the cemetery trees, and an average of 1% of tree population damaged by a storm event, with an average of 3 damaging storms per year. Estimated number of trees scheduled

for maintenance due to storm damage is expected to be higher than current level of service provided due to more thorough inspections of all cemeteries.

- Prune trees only as necessary to reduce risk or improve tree health using the following prioritization levels:
  - 1<sup>st</sup> Priority – prune for safety (Level 1)
  - 2<sup>nd</sup> Priority – prune to preserve health of the tree including improving structure (Level 2)
  - 3<sup>rd</sup> Priority – Prune for aesthetics. Special Note: Topping of crape myrtles shall not be performed. (Level 3)
- Provide supplemental watering to all trees when there is insufficient rainfall.
  - Cost estimate based on providing an average of 170 gallons of water per tree on a monthly basis to each of the 4578 cemetery trees in currently maintained areas. This is based on an average diameter of 17", and providing 10 gallons per inch of diameter, as recommended by Austin Water Utility. This works out to providing 778,260 gallons of water per month to the cemetery trees, in months where there is deemed to be insufficient rainfall. A single water truck has a capacity of 1800 gallons, so it will require 432 loads to provide this amount of water. One water truck can at most safely haul and distribute 4 loads per day, and there are 20 working days in a month, so this will require the addition of 6 water trucks to the Urban Forestry fleet. A water truck cost ~\$121,000, so it would cost \$726,000 initially to purchase these trucks. It would take 6 full time employees to operate these trucks, at a cost of \$25.51/hour per employee, and it cost \$25/hour per truck. So this would cost \$24,490 per month for labor, and \$24,000 for equipment, for a total monthly cost of \$48,490. It is estimated that the supplemental water would be required no more than 6 months of a year, for a total yearly cost of \$290,940.

See back for funding level summary.

## Summary of Estimated Levels of Funding

Item	Hours	Additional Costs	Rate	Current Level of Funding	Required Level of Funding	Funding Gap
Tree protection/site plan review	624	\$ -	\$ 30.53	\$ 1,588.00	\$ 19,051.00	\$ 17,463.00
Soil Testing - nutrients and bulk density	50	\$ 6,142.00	\$ 30.53	\$ -	\$ 7,668.50	\$ 7,668.50
Composting & Mulching	6867	\$ 98,910.00	\$ 91.23	\$ -	\$ 725,386.41	\$ 725,386.41
Level 1 inspection & maintenance	225	\$ 285,763.00	\$ 28.66	\$ 50,000.00	\$ 292,211.50	\$ 242,211.50
Level 2 pruning	2277	\$ -	\$ 131.23	\$ -	\$ 298,810.71	\$ 298,810.71
Level 3 pruning	2277	\$ -	\$ 131.23	\$ -	\$ 298,810.71	\$ 298,810.71
Cabling/Bracing/Propping inspection time	719	\$ -	\$ 28.66	\$ -	\$ 20,606.54	\$ 20,606.54
Cabling/Bracing/Propping installation cost	N/A	\$ 17,000.00	N/A	\$ -	\$ 17,000.00	\$ 17,000.00
Inspection following storms	225	\$ -	\$ 28.66	\$ -	\$ 6,448.50	\$ 6,448.50
Maintenance following storms	138	\$ -	\$ 131.23	\$ 5,511.66	\$ 18,109.74	\$ 12,598.08
Provide supplemental water as necessary	5760	\$ -	\$ 50.51	\$ -	\$ 290,937.60	\$ 290,937.60
One-time capital purchase of 6 water trucks	N/A	\$ 726,000.00	N/A	\$ -	\$ 726,000.00	\$ 726,000.00
		Total Year 1 Funding		\$ 57,099.66	\$ 2,721,041.21	\$ 2,663,941.55
		Total Yearly Funding		\$ 57,099.66	\$ 1,995,041.21	\$ 1,937,941.55